

Application Serial No. 10/628,070

Page 2 of 12

Date: May 19, 2006

Reply to Office Action dated March 6, 2006

In the Specification:

Please replace paragraph [0037] with the following paragraph.

[0037] The heater module ~~110~~ 10 includes a heat exchange mass or body ~~140~~ 40 formed of a suitable high thermally conductive material. Although the mass ~~140~~ 40 is described as being formed of die-cast, molded, or cast or machined aluminum, other materials, either homogenous or nonhomogeneous, may also be employed. For example, the mass 40 can be formed of alumina particles, ceramic materials, etc. The use of molding or casting techniques enables highly thermally conductive and moldable materials to be employed for the thermal mass ~~140~~ 40. For example, the mass 40 may be formed of a highly conductive ceramic material, such as aluminum oxide, aluminum nitride, boron nitride or magnesium oxide which can be molded or cast into the shape of the thermal mass ~~140~~ 40 described hereafter and shown in Figs. 2-14. The use of ceramic material forms a compact, dense mass of low porosity which provides the desired high thermal conductivity between the heater elements mounted in the mass, the mass itself and the fluid flowing through the mass.

Please replace paragraph [0038] with the following paragraph.

[0038] When a casting process is employed, the heat transfer rate and/thermal conductivity of the material forming the thermal mass ~~140~~ 40 can be improved when a solid, low porosity material is utilized. Material processing methods, such as squeeze casting, thixocasting, rhicasting, machining of a solid mill block, etc., can be advantageously employed since such processing methods remove or minimize the porosity or voids for the final formed mass. This enables the thermal conductivity of the thermal mass ~~140~~ to be significantly increase.

Please replace paragraph [0043] with the following paragraph.

[0043] A thermal mass, similar to the thermal mass ~~140~~ 40, with a different shape or cross-section can also be formed of various materials, such as aluminum, ceramics and poltruded carbon materials by extrusion.

Application Serial No. 10/628,070
Date May 19, 2006
Reply to Office Action dated March 6, 2006

Page 3 of 12

Please replace paragraph [0044] with the following paragraph.

[0044] Regardless of which of the above mentioned materials and processing techniques are used to form the thermal mass ~~140~~ 40, the present invention provides a thermal mass ~~140~~ 40 with low porosity and low internal void and interstitial spaces thereby providing the thermal mass ~~140~~ 40 with a high thermal conductivity for high heat transfer between the heating elements through the thermal mass ~~140~~ 40 to the fluid flowing through the channels in the thermal mass, as described hereafter.

Please replace paragraph [0075] with the following paragraph.

[0075] To further enhance transfer of the heat generated by the MOSFETs 156 to the first plate ~~140~~ 73, a highly conductive pad or plate 161, hereafter referred to as a sill pad 161, is interposed in contact between the printed circuit board 150 and the first plate ~~23~~ 73 as shown in Figs. 3, 8 and 9. The sill pad 161 typically has a planar shape and dimensions to extend over at least a portion of the first plate 73. The pad 161 isolates stray electrical currents to negative ground through the screws 75, provides a positive contact between the MOSFETs and the thermal mass 40, and stabilizes heat loss through the adjacent cover by maintaining the temperature of the plate 73 at a higher temperature to thereby create a lower temperature differential or gradient with respect to the thermal mass 40.